

WHAT IS CLAIMED IS:

1                   1.       Thermal insulation for an underwater component comprising,  
2   a heat-insulating molding surrounding the component and a resilient water-resistant  
3   envelope surrounding the heat-insulating molding, wherein the heat-insulating  
4   molding is a nanoporous, mesoporous or microporous material based on precipitated  
5   or pyrogenic silica, arc silica and/or aerogel.

1                   2.       The heat insulation of claim 1, wherein the microporous  
2   insulation material is present encased within a sheet.

1                   3.       The heat insulation of claim 2, wherein the sheet is a single-  
2   ply sheet such as, for example, a polyethylene (PE) sheet or a polyamide (PA) sheet  
3   or a multiply sheet (laminated sheet), such as, for example, a PE/PA sheet or a  
4   PE/PA/polypropylene sheet.

1                   4.       The heat insulation material of claim 3 wherein said single-ply  
2   sheet comprises polyethylene or polyamide.

1                   5.       The heat insulation of claim 3, wherein said multi-ply sheet  
2   comprises polyethylene/polyamide or polyethylene/polyamide/polypropylene.

1                   6.       The heat insulation of claim 2, wherein the sheet exhibits  
2   reduced permeability to fluids and is metallized or contains a metal layer to reduce  
3   permeability.

1                   7.       The heat insulation of claim 2, wherein the interior of the  
2   sheet is evacuated.

3                   8.       The heat insulation of claim 1, wherein the resilient water-  
4   resistant envelope is a material having an elongation at break of from 100 to  
5   1,000%.

1                    9.        The heat insulation of claim 1, wherein the resilient water-  
2        resistant envelope is an elastomer or a resilient thermoplastic.

1                    10.        A method for the thermal insulation of an underwater  
2        component in oil and gas production, comprising surrounding the underwater  
3        component by a microporous material and is providing a resilient, water-resistant  
4        envelope, around said microporous material.

1                    11.        A thermally insulated underwater component, prepared by the  
2        method of claim 10.

1                    12.        The thermally insulated component of claim 11, wherein said  
2        microporous material is encased within a polymer sheath, said microporous material  
3        having a plurality of incisions therein which render it flexible and conformable to  
4        said underwater component.

1                    13.        The thermally insulated component of claim 12, wherein said  
2        microporous material comprises pyrogenic silica.

1                    14.        The thermally insulated component of claim 10, wherein no  
2        protective steel sheath surrounds said resilient water-resistant envelope.

1                    15.        The thermally insulated component of claim 10, wherein said  
2        microporous material has a density at 300 bar pressure of about 1,000 Kg/m<sup>3</sup> and  
3        a thermal conductivity of about 0.06 W/mK or less.